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ENTIFIC QUARTERLY DEALING WITH EXTRASENSORY PERCEPTION, THE PSYCHOKINETIC EFFECT, AND RELATED TOPICS

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THE RELATIONSHIP BETWEEN CHANGES IN STUDENT ATTITUDE AND ESP SCORING

By MARGARET ANDERSON AND RHEA WHITE[1]

ABSTRACT: This report covers the fifth of a series of experiments by the authors to test the relationship between teacher-pupil attitudes and the level of scoring in clairvoyance tests.

The special point of this experiment was to see if changes in teacher-pupil attitudes from the beginning of the school semester to the end, in a particular classroom, might be reflected in the ESP scores.

Accordingly, ESP tests and attitude questionnaires were administered by the teacher, both at the beginning and then at the end of the semester. The unopened test materials were returned to the Parapsychology Laboratory at Duke University and checked separately by both authors in order to safeguard against error.

The results show that changes in the teacher's attitude toward the pupil, as well as changes in their mutual attitudes, were not associated with significant changes in ESP scores. However, changes in the attitudes of the students to the teacher were significantly related to changes in the level of ESP scoring. They also indicate that one might expect better results in ESP tests administered toward the end rather than at the beginning of the school term.—Ed.

INTRODUCTION

THERE HAVE BEEN reports in recent literature in parapsychology giving evidence of the occurrence of ESP in classroom tests. Van Busschbach's experiments in Holland and America (5, 6, 7), and, more currently, those carried out by the authors (1, 2, 3) attest to the fact.

The question pursued by van Busschbach was: Does ESP occur in the classroom if the teacher acts as an agent in a GESP test? His

[1] The authors wish to thank Mr. Robert Maxwell and his class for their cooperation in this project. Both authors were supported in this work by Ralph Drake Perry Fellowships.

experiments, which were made with fifth and sixth grade pupils, gave significant results.

Our question has been: Is there a relationship between the attitude of teachers toward their pupils and vice versa, and the students' rate of scoring in ESP tests? We have shown that in our experiments (referred to hereafter as the A-W series) the liking of the pupil for the teacher and the attitude of the latter toward the pupil bears a significant relation to the pupil's scoring in a clairvoyance test of ESP administered by the teacher. A recent investigation of ours (**4**) further supports the importance of attitude, indicating that in a GESP test with two teacher-agents simultaneously looking at different targets, the students tended to score above chance with the teacher they liked the best and avoided the targets of the teacher for whom they had expressed no preference.

One of the many questions which has been raised by the experiments in the classroom is whether it would make a difference at what time in the school year the ESP tests were given, and, more important, whether changes in attitude registered from a test given early in the year and a test given later in the year would be accompanied by a corresponding change in ESP scores. The present report was an attempt to explore these two questions. Mr. Robert Maxwell, one of the teachers who had taken part in our A-W 2 series, agreed to give his 29 seniors at the Roswell Senior High School in New Mexico the A-W test on the fourth day of school in the fall semester of 1957 and then again near the end of the semester.

Procedure

The type of testing procedure used in this experiment and described below is identical with that used in our previously published high school work (**2**, **3**). The teacher administered the test. At the beginning of the semester, after the teacher had instructed the students about their part in the experiment (see **2**, 153), each subject was given a sealed manila envelope, prepared at the Parapsychology Laboratory at Duke University, containing an ESP record sheet on which had been listed 125 ESP symbols. He was asked to write down, on a record sheet stapled to the outside of the envelope, what he thought the symbols were. A carbon copy of

his calls was made on a second sheet. Teacher and pupils also filled out questionnaires designed to reveal their attitudes toward each other (see **2**, 156). The students sealed their questionnaires in individual envelopes, and they were assured that the teacher would not see these. The students' call sheets and the sealed envelopes containing the ESP targets and the students' answers to the questionnaire about the teacher, together with the teacher's questionnaire were returned unopened to the authors at the Duke Parapsychology Laboratory for checking.

When the test materials were received, each experimenter individually drew up her own master sheet, working from the list of names which the teacher had sent in order to assure independence of checking. When this was done, each had in her possession a record of the names of the students and the rating given them by the teacher.

Next the experimenters opened the envelopes with the students' answers to the questions about their teacher. Each experimenter, independent of the other, scored these questionnaires according to a system of rating which had been decided upon prior to the A-W 1 experiment and which has also been used in later researches. The student ratings were entered on each experimenter's master sheet. When this task had been completed, the experimenters compared the entries on their master sheets. Where discrepancies were noted, the experimenters independently referred to the original records until they concurred as to which rating was correct.

The manila envelopes were then opened. Since we had retained a carbon copy of the target sheet at the Laboratory, and since the students had made carbons of their responses, we now possessed two copies of both the students' guesses and the target symbols. Each experimenter checked a different copy of the calls and targets independent of the other. These scores were entered on the master sheets and the two orders of results were then compared run by run. If a disagreement in score was found, each experimenter went back to the score sheets and checked again until the mistake was found, agreed upon, and corrected. The experimenters then independently totalled the data on the basis of attitude classification and compared results until the correct figures were determined.

The ESP data were checked a third time by Mrs. Betsy Moser at the Parapsychology Laboratory without knowledge of the attitude ratings.

Near the end of the semester, the teacher administered a second test, exactly like the first, only with a different order of target symbols. When this material was returned to the Parapsychology Laboratory, unopened as before, the same checking procedure was followed as with the first test.

Results

The over-all results in the A-W test administered on the fourth day of the fall semester to the 29 subjects gave an average run score of 4.88 (where 5.00 is mean chance expectation). The average run score at the end of the semester was 5.35. The CR of the difference is 2.03, P = .042 which, though not significant, is suggestive (see Table 1). The over-all results obtained by this teacher with 31 students in the A-W 2 series had produced an average run score of 5.15.

Table 1

ESP Results According to Time of Year Test Given

Time of Test	No. of Subjects	No. of Runs	Av. Run Score	Dev.	CR	P
1st Week of School.....	29	145	4.88	−18	....	...
End of Semester.....	29	145	5.35	+51	2.12	.03

$CR_d = 2.03$; P = .042

In order to determine the consistency of individual scoring above and below M.C.E. obtained between Test 1 given at the outset of the semester and Test 2 given at the end of the semester, the results were arranged in a two-by-two contingency table. The chi-square is 3.38 (1 d.f.) which, with P = .065, is not significant.

From our viewpoint, the most pertinent question raised by this experiment was whether attitudinal changes would reveal a corresponding change in ESP scores. Considering attitudinal changes on a point-by-point basis of the 10-point questionnaire, 14 subjects became more positive in their feeling for the teacher as the year

progressed. The average run score of these 14 subjects in Test 1 was 4.57 as compared with an average run score of 5.66 in Test 2. The CR of the difference, 3.21, between the scoring on the two tests is significant with P = .001. This indicates that when the attitudes became more positive so did the level of ESP scoring. A *t*-test analysis of the improvement in scoring of these 14 subjects gives a *t* of 4.61 with P = .001.

Seven students in Test 2 became more negative in their feeling toward the teacher; on this second test they scored an average run score of 5.20 compared to an average run score of 5.57 on Test 1. Though the directional tendency is what one might expect, i.e. lower ESP scoring with negative attitudes, the CR of the difference is not significant (1.73).

Eight students did not change in attitude from Test 1 to Test 2; and they scored at approximately the same level on both tests, the average run score being 4.80 on Test 1 and 4.95 on Test 2.

In order to evaluate the consistency of the student's ESP scoring according to whether his attitude went up or down from Test 1 to Test 2, the results were arranged in a two-by-two contingency table. The probability, computed by the exact method, of the number of subjects whose scores improved, and the number of subjects whose scores went down, divided according to attitudinal changes, are given in Table 2. This table is, of course, our most

Table 2

STUDENT ESP SCORES IN RELATION TO ATTITUDINAL CHANGE TOWARD TEACHER

ESP Score	Attitude went up	Attitude went down	
Up	12	2	14
Down	2	5	7
	14	7	21

P= .017 (Exact Method)

important one, since it evaluates the over-all consistency of the results. It gives a marginally significant order of consistency with $P = .017$.

The relation of the students' ESP scoring and changes in the teacher's attitude was also examined. The teacher changed his attitude nine times between Test 1 and Test 2. Six changes were from a positive attitude in Test 1 to a negative one in Test 2, while three were from the negative to the positive category between the two tests. The average run score for the six students liked by the teacher in Test 1 is 4.83 as contrasted with an average run score of 5.07 in Test 2 where he indicated a negative feeling. On the other hand, where the teacher indicated a negative attitude toward three subjects in Test 1, the average run score is 5.13 as compared with 5.33 in Test 2, where the teacher indicated a favorable attitude to the subjects. These differences are not large enough to be suggestive.

From the standpoint of the interaction of the teacher-pupil attitudes, the results correspond by and large to the findings in the previously reported A-W experiments. In this respect too, it appears that the level of ESP scoring according to attitudinal classification in

Table 3

ESP Results as Related to Attitude of Teacher and Student Toward Each Other

Rating of Teacher by Student	Test	Teacher Positive			Teacher Negative		
		No. of Subjects	No. of Runs	Av. Run Score	No. of Subjects	No. of Runs	Av. Run Score
10-9 (Positive)	1	8	40	5.08	6	30	5.33
	2	10	50	5.08	10	50	5.44
8-7 (Positive)	1	5	25	4.48	5	25	4.60
	2	3	15	6.33	5	25	5.20
Total Positive Ratings	1	13	65	4.85	11	55	5.00
	2	13	65	5.37	15	75	5.36
6-0 (Negative)	1	3	15	4.73	2	10	4.60
	2	none	..	....	1	5	5.00

Test 2 is more in line than Test 1 with results of the previous work. These results, presented in Table 3, are included only for the comparative interest in relation to previous findings (see 3, p. 95), which they may hold for the reader.

Discussion

The main value of the present study lies in the impetus it gives for continued research on this new approach to the relation of ESP scoring and teacher-pupil attitudes. The A-W investigations, while pointing out the importance of the interacting feelings between teacher and pupil, have also suggested that when the level of ESP scoring is considered together with a breakdown of pupil attitudes alone or teacher attitudes alone, the pupil's attitudes yield the more significant separation. The same effect persists in this study. Also, the results strongly indicate that attitudes, particularly student attitudes, do change in the course of the school semester and that these changes are related to the level of ESP scoring. Between the two tests 72% of the students changed in attitude, while the teacher's attitude changed for only 31% of the students. There was an increase of 69 hits in the over-all ESP score between the two tests; this increase in scoring on Test 2 is primarily the contribution of the 14 subjects who became more positive in their attitude. This group went from a deviation of -30 on Test 1 to a $+46$ on Test 2.

It is interesting to compare the averages at the beginning of the semester (4.88) and at the end (5.35) in the present study with the results obtained by this teacher in A-W 2. The over-all results obtained by this teacher with 31 pupils in that series gave an average of 5.15. That test was given in the middle of the semester (the latter part of November, 1956). It is interesting to notice that the run average falls approximately midway between the averages for the beginning and end of the present study. This strengthens the suggestion given by the present experiment that as the relationship between teacher and pupil develops over the course of the semester, the ESP score increases.

These ESP experiments in the classroom raise interesting questions concerning the role of the teacher in the test situation. It will be recalled that the teacher in the research reported here also took part in the A-W 2 series. He was, therefore, at the time of the

present experiment, fully acquainted with the findings and interpretations of the findings which the authors had published. Furthermore, he was aware of what the authors were seeking to find out in the later tests. Though the teacher knew, the students did not. Outside of knowing the results of their scores on Test 1, they had no knowledge of the purpose of the experiment.

It does seem that if the teacher is involved in an ESP test, be it as an agent or the one who merely presents the tests to the class, these should be conducted in the classroom only after sufficient time has elapsed for good interpersonal relations to have been established.

The results reported permit us to say that ESP has again been demonstrated in the classroom and again a relation between ESP scoring rate and the pupils' attitude toward the teacher has been found. This paper adds to the A-W research the novel feature of two measures with the same pupils at different stages of relationship with the teacher and hereby puts to a more definite test the attitude-ESP association. Tied in with the results of our preceding papers, our present report would seem to leave little doubt of an important association between the pupil's experience with his teacher and his capacity to register his ESP ability in the classroom test given by that teacher.

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ON THE NATURE AND CONSEQUENCES OF THE UNCONSCIOUSNESS OF PSI

By J. B. RHINE

THE PRIMARY aim in studying psi today is to expand our knowledge of its nature. This purpose is served especially well by comparisons with related and better known functions. One of the especially relevant questions, for example, is how extrasensory perception differs from sensory perception. This area of comparative study is not only illuminating, but it is also readily accessible.

Much, of course, is already known about the relation between SP and ESP. For example, on the side of differences no indication is found in ESP of the operation that in SP is called stimulation—the physical activation of sense organs. Furthermore, no essential intervening physical action has been found as yet in ESP, and the indications are that there is nothing known in physics that, under the conditions, could act as a stimulating activity.

There is, coupled with this absence of stimulation or physical intermediation, a further contrast between ESP and SP, though it may merely be another way of stating the point just made: Within the range thus far investigated no limitations of space-time on the successful functioning of ESP have been found. However ESP may operate, it is not conditioned by space-time. But it is, after all, upon physical operations that space-time as a concept depends. The concept, as a matter of fact, emerges from the sensorially perceived world of physical change. ESP, then, should not be expected to relate to space-time if it is not brought about by physical stimulation.

On the other hand, the important characteristic of volitional influence seems no different in ESP from what it is in SP; that is, there is no discoverable difference in character or quality of the exercise of the will. The much greater difference in efficiency of control in SP is another matter and does not affect the observation that ESP, like SP, is purposive and voluntary. The subject in a test of ESP, as in one of SP, can turn his attention voluntarily to a given target, selecting one out of many, in different space-time situations. Even in nonexperimental or natural situations, both in SP

and ESP, the same motivational basis applies. It is true, experience in both types of perception often occurs without the initiative of conscious volition. One hears without a deliberate attempt to listen; similarly, one receives ESP impressions intuitively without any deliberate attempt to have the experience, but the same implicit readiness of interest, the same latent, purposive orientation may be assumed in one area as well as in the other.

The feature in the ESP experience itself that seems most differentiated from SP is the lack of any distinctive conscious mode of subjective experience such as characterizes each of the different kinds of sensory perception. When one sees a light he is able to distinguish it definitely from an auditory experience. He knows that when he is smelling, he is not seeing. He has this awareness of the sensory differences without knowing anything about the underlying processes or the physics of stimulation. *ESP, however, has no distinctive modality,* and since the distinctive sensory modalities are essential aspects of consciousness we can conclude that ESP, which has none, occurs without conscious awareness or, in short, is *un*conscious.

How, then, does the ESP effect register itself on the attention of the subject or those about him? From the side of spontaneous experiences L. E. Rhine has indicated the nature of these devices of ESP expression. The ESP content or "message" is converted into one of the already familiar mechanisms of common experience. To the sleeping subject the device is the dream, either the realistic pictorial dream or the fantasy dream. To the waking individual the devices are intuition, hallucination, or compulsive action. The ESP information must be conveyed by one of these means; it has no primary property of conscious experience by which to gain admission; accordingly, there is no such property by which to identify it. That is why, as it now appears, the subject cannot be conscious of it as such, as he is of seeing or hearing or smelling or feeling pain. ESP must utilize channels in its operation which, as they appear in consciousness, may or may not represent ESP. Intuition, hallucination, dreams, compulsions are familiar enough in non-ESP contexts. Accordingly, even when the subject knows he has had a dream, hallucination, or intuition, he does not thereby know that he has had an ESP experience.

Likewise in experimental testing, even when the evidence of the occurrence of ESP in a series of trials is inescapable, the subject himself is unable to differentiate his experience in giving a successful response from the experience associated with a wrong one. He may be aware that in a certain run of trials he felt more like trying hard, had more confidence, or felt very good about the test as a whole; but the specific modality of the experience which would give consciousness a reliable grip on ESP is lacking.

The practices or habits that subjects commonly adopt in the ESP tests are their own adaptations of familiar devices. In a card test in which a known range of symbols is used, a naïve subject may follow some simple associative pattern: he may fall into rhythms or even reason about the likelihood of the card order; or, again, he may be influenced unduly by memory. The more sophisticated subject will try to approximate an intuitive selection of the symbol that gives him the strongest impression at the instant. Others, perhaps more given to motor dominance, will prefer a semi-automatic motor response, like pointing, pressing buttons, and the like to indicate their choices. Still others, who dissociate easily, will allow hallucinatory patterns to form on the wall, on some shiny surface, or on the closed eyelid. Fundamentally, all this is little different from the more casual selection that goes on in the spontaneous cases when the most readily available device—dream, hallucination, or intuition—is seized upon to communicate the ESP information.

Consciousness is, as is now well known, a relative matter even with SP; that is, SP itself is accompanied by a range of different *degrees* of consciousness, quite apart from those *qualities* of conscious experience that make up the distinct sensory modalities (vision, hearing, etc.). These variable degrees range down through the recallable subconscious impressions of experiences that pass unnoticed at the instant, on into the lower stratum of those which can be shown to have produced a measurable effect on behavior but which are beyond the subject's recall. These last are truly unconscious SP's. In addition, divided or restricted attention occurs, such as may be induced in hypnosis or may take place in light sleep, under intense preoccupation, or as a result of special training. These channeled or dissociated modifications of consciousness need not concern us, since it does not appear that in ESP we are dealing with

anything like this nor with the kind of unconsciousness that, as with SP, may result from subliminal stimulation or under distraction of attention.

The point to hold in focus is that there is a distinctive quality or mode of experience for each form of SP, which may or may not be fully conscious, as the perceptual action occurs. In ESP, on the other hand, there is for conscious registration only the converted forms or devices into which the information to be conveyed has been translated, forms that in themselves give no sign as to whether or not they are the bearers of ESP communications. Neither in spontaneous experiences nor in the experimental performance has any introspectively observable characteristic peculiar to ESP been found. Individual subjects differ in the mental devices utilized. Thus no one device or modality of experience can be said to predominate as a characteristic way of mediating ESP to expression. This is not to say, however, that one form of experience is as good as another for the exercise of ESP, or to imply that the development of a more successful and even characteristic vehicle is impossible. It is merely an attempt to outline the status of our knowledge today.

* * *

According to this picture drawn from present knowledge with its recognized limitations, we are not only unconscious of ESP as a special perceptual experience; it is even hard to conceive how we could expect ever to become conscious of it, occurring as it does through the intermediation of another form of experience. For the present, at least, we must add to the fact that ESP is unconscious the further observation that there is no very encouraging indication that it may be brought into consciousness in any recognizable way. Not even in the wide range of experiences occurring spontaneously is there the suggestion of a modality or an accompanying aspect of ESP experience that is characteristic of that parapsychical process as such—though the aspect of "conviction" should be watched.

Accordingly, this peculiarity of the unconsciousness of psi may be taken as an extremely important fact about it, one that should offer an advantageous opening for exploration. However, this must be said with some definite qualifications. One of these is the already mentioned fact about SP itself, that it is not *always* conscious. In

this respect, however, SP is like memory, reasoning, and a range of other familiar mental abilities. Being subject to a wide range of degrees of consciousness is a general characteristic of personality, at least in the human species. But this relative and limited unconsciousness of non-psi functions is, as stated, a different matter from the lack of any distinguishing conscious modality *ever* experienced as identifying ESP as a phenomenon. Thus far there are no exceptions, and, accordingly, no indication of differences in degree of the unconsciousness of ESP. It is total so far as direct experience is concerned. Even where the results of an ESP test represent very high scoring, the subjects cannot be said to have had any more illuminating experience as to what was taking place or how it was done than when in another series no evidence whatever of ESP emerged.

There is a still further comparison to be made with this graded consciousness of SP. When a subject who has been producing positive deviations indicating evidence of ESP is made to continue in the test under circumstances that induce some strain, he may decline in scoring rate to a level which gives a considerable, perhaps even an equal or a greater amount of evidence of ESP by way of a *negative deviation* from mean chance expectation. In ESP in such a case the subject continues to have equally vivid consciousness of the experience accompanying his test. He is still selecting one symbol from the total range. He is still actively aware of what he is doing, but this is just the same as it was in the beginning positive phase. He does not know he is reversing his ESP effect. On the other hand, in SP, let us suppose the target series in a visual test should be reduced in visibility to the point where the scoring rate would fall to the chance level; the subject would know approximately when he became unconscious of any identifiable target, as he would know when increase of visibility brought it back into range.

It is appropriate, however, to mention that there are some, indeed not a few, psi experiences that are known at the time to be distinctive, and to be so unlike SP (and, therefore, unfamiliar) that the subject is aware that some unusual cognitive experience has taken place. It is not that the ESP function occurs in such an identifiable way that it is consciously recognized as such; rather, as a result of the experience, there is an awareness that it would not have been

sensorially possible. For example, when all too successfully one finds a lost object in some quite unexpected location, it is the immediate verification that drives home the unusualness of the experience. In such a case it is the individual's judgment that by itself leads to the conclusion. It is not the peculiar character of the experience. If he had not had the immediate checkup to inform him that something exceptional had been experienced, ESP (or, whatever in his language he would have called it), would not have become known to him as such. It would simply have passed as a meaningless impresssion.

But there is still another qualification to the distinction being made between ESP and SP, and this may be an extremely important one: Sometimes the subject has a confident judgment of the validity of an ESP experience, even *before* he has had an opportunity to check up on it. His conviction *accompanies* the experience and often leads to definite action implying confident decision. The experience may vary widely as to content or completeness. In some cases the message itself is incompletely converted to conscious awareness; the subject's information may only be that there is something wrong at home; or, the amount of detail conveyed may be considerable. Again, however, there is nothing in the *form of modality* of the subject's experience that identifies it as a genuinely true impression. The experience is, as L. E. Rhine found from a comparative study of conviction cases, of the same character and quality as those in which there is no conviction. The only conscious difference is the feeling of certainty itself. It is not, therefore, the subject's conscious identification of the experience as ESP that makes him confident about it. Rather, there seems to be some sort of induced affect accompanying the conversion of the information into the experienced form. This conviction of validity would seem, perhaps, more like an aspect of the conversion itself than anything else. It looks as though the translation function, in converting the coded message into a meaningful experience for the subject, may be presenting its case with an even fuller emotional value than usual, and that this association carries a degree of conviction which leads to acceptance and action.

Tempted though we may be to turn hopefully to this feature of conviction as perhaps a promising clue to a new handle of consciousness the subject may learn to seize in recognizing true ESP among

its substitutes, it is necessary to be hesitant. We must remember that, when under the influence of strong motivation and emotional accompaniment, subjects also have nonparapsychical intuitions, hallucinations, dreams, and the like and that these very often carry the same powerful sense of conviction and may also lead to vigorous and even precipitate action. In other words, it is normal enough for strongly meaningful experiences, whether or not they have a psi content, to be accompanied by vigorous inclination to acceptance and action. Hallucinations and even hunches of non-psi character can be accompanied by conviction without necessarily having any veridical psi element.

It is true that the individual who has a genuine psi experience based, let us say, on a visual apparition, and who experiences such strong conviction as to leave no doubt that he knew the message was true, may feel assured from his own personal judgment (of his mental health, past experiences, etc.) that his hallucination was not likely a pathological one. The qualification should, therefore, be made that it does seem to be possible in some cases to make a reliable judgment that an experience is a genuine ESP occurrence. But the point I am making is that such a judgment is not reliably derivable solely and directly from the conscious content of any identifying mode of the experience itself, not even from the strong confident feeling of veridicality the subject may have. This latter has too many counterparts in areas of mental life outside parapsychology. The conviction judgment or inference may become of the greatest importance in parapsychology; but it needs to be kept in its distinctive status of classification. It is not awareness of ESP as such.

* * *

What importance can now be seen in this evident fact of the unconsciousness of psi—or, as it might be put, in the fact that it does not have a seat of its own in the court of conscious experience? Any suggestions attempted now can only be starting points, because the importance of any fact depends greatly upon what other facts may be related. In the field of parapsychology these are in the process of being uncovered. Relative consciousness, too, is a frontier area of study for general psychology as well—one that is currently being forced into more general attention by the commercial interests de-

voted to techniques of subtle persuasion, both during sleep and waking hours.

One of these starting points from which to follow up the significance of the unconsciousness of psi is in the range of peculiar effects attributable to this unconsciousness. These have been pointed out from time to time and rightly attributed to the subject's lack of awareness of just what he was doing. I refer to such effects as psi missing, declines of scoring rates of more or less regular or recurrent character, displacement, consistent missing, and some related effects. In general, those who have discussed these effects in relation to the unconsciousness of psi have only been able to make the point that the lack of awareness by the subject *allowed* these peculiar departures from what would be normal in a comparable test of SP. I think the main advance in interpreting the findings in the light of the above discussion of the nature of this unconsciousness might come from recognizing that it is no longer going to be profitable or correct to think of psi as we think of unconscious SP—something which, with increased stimulation or increased motivation, might be shifted up the scale of consciousness. Rather, ESP is not on such a scale, if I have been describing it correctly. Perhaps this difference might be checked by a systematic, comparative study of the effect on subliminal SP of the conditions which have produced the odd results listed above in ESP (psi missing, etc.). Studies of this type have been encouraged, and in a few instances, approximated; but I know of nothing that duplicates on the SP side the range of oddities in ESP results that arise seemingly because of its unconsciousness. (There are, to be sure, some similarities between ESP and learning tests, as well as between ESP and memory test results; similar decline curves and U-curves have been found in all three. These may, however, be only the superficial effects of test-run structuring.)

Thus, in shifting away from the idea of ESP as simply being at the lower end of the consciousness scale over which SP extends, we come, I think, to an understandable picture (hypothetical, of course, as yet) of what lies behind these ESP effects that are so odd and exceptional. Take psi missing, for example, and consider it as it has appeared in the many studies in ESP in comparative situations. Hardly any phenomenon of ESP has come to be more nearly unique and has better served as an identifying feature than the tendency to

go into reverse—a reverse that is geared (roughly, at least) at the same rate as the positive. This is, of course, partly a consequence of the extremely sensitive and delicate nature of ESP and, of course, it owes much to the standardization of test methods, statistical procedures, and the accumulation of large blocks of comparable data. But the studies of the past twenty years have shown the psi function as convertible in about equal amount either to a positive or a negative trend of deviation from mean chance. The direction of the trend seems to depend on certain conditions which affect the subject's delicate mechanism of conversion. In no better way has this bifurcated channeling been demonstrated than in the Anderson and White series of studies in schools, in which mutual likes of teachers and pupils are accompanied by positive deviations and mutual dislikes by negative. Another and even more familiar demonstration of this divisible character of the ESP response occurs in the long-drawn-out series of sheep-goat experiments of Schmeidler.

It may be said now with some confidence that this division is probably brought about by the same "control room" or conversion center which, as we have seen above, determines whether the information communicated in ESP emerges as an hallucination, an intuition, a dream, or a compulsion. The operations of this center may be ever so much more complicated than as yet we have any idea, but certainly we must allow that it does have some comparatively lawful types of misinterpretation or wrong translation of its information in order to lead thus to consistent missing or displacement or whatever the distortion may be.

It would appear that the various mental measurements that have been found related to such effects, for example, as psi missing, have been related closely to the complicated structure of personality through which the message of psi must be channeled. It is more understandable then that the impression has only gradually dawned on many of us in these investigations of related states that the relationships thus far found have largely had to do only with those secondary factors and conditions of personality through which psi information must pass and by which it is more or less distorted or inhibited, rather than with psi itself. In short, we have been working on the correlates of the translation process rather than on the

underlying communication function (if such an isolated conception of psi is tenable).

The question of what change this re-examination of the unconsciousness of psi may make in the general picture of parapsychology and the place of psi in the total personality system is another point for discussion. It may be worth while to try to summarize the general knowledge and working interpretation of it as held by many of us now at work in the research field. While, on the one hand, SP is based on known physical stimulation, known organic receptors, and distinctive modalities of experience associated with localizable brain centers and thereby furnishes the basic elements in the framework of consciousness—ESP, on the other hand, is *not* physically explainable, has *not* been associated with any organic receptors or brain center, has *no* distinguishing feature in conscious experience, and has given many evidential grounds for the hypothesis of its early evolutionary origin. Altogether, this suggests, although it is frankly only a suggestion, that ESP may have some contiguity with an area of forces or influences within the organism coming into prominence in biological thought as having to do with the organizing, the directing, and the systematizing of life processes. It could be something more primitive and basic and general than the specialized senses, something antedating the evolutionary origin of consciousness.

But however far this hypothetical thinking may be justified, it must be kept in mind on the factual side of the ledger that regardless of how nonphysical psi may be in some essential part of its operation, it is (or we should never have known about it) convertible to physical registration; no matter how extrasensorially the information may be received, beyond question that information is convertible to SP derivatives (to the imagination, hallucination, the dream, etc.). No matter how unconscious and how irrecoverably unconscious the essential psi function may be, the information is convertible to conscious experience in most subjects or to unconscious modes of response in some instances. Expression is, in one way or another, possible. The important framework of fact that must be considered a part of the picture itself is this realization that psi is part of the psychophysical unity of the personality, of the organism and of nature. This, of course, is in no way altered by the realization that

psi is, and may even forever be, foreign to the world of direct conscious experiences.

* * *

Interest in achieving control over parapsychical abilities is, at least for the present, paramount. How, if at all, does it advance this urgent interest to recognize that we can deal with ESP only through the intermediation of some kind of translating mechanism controlling the channels of psi communication?

For one thing, it would considerably altar the thinking of many of us who have long hoped to find a means of bringing psi capacity "up" to a conscious level of operation.

It would, rather, seem much more in order now to turn attention to the question of the comparative value of the different vehicular devices needed for the manifestation of psi effects. Which of the various mechanisms of expression are most effective? This, of course, will need to be asked of each individual, and yet there will be a certain general relationship possible, a degree of lawfulness, a rank-order of merit for different possibilities. The effect of the test conditions themselves upon these devices may be an important and delicate relation to keep in the focus of attention.

It should give more point to those exploratory studies of the use of drugs and of the cultivation of special psychological states that might help the conversion process and facilitate the translation of psi information more efficiently. At any rate, the accumulation of information regarding these secondary factors and devices that serve to influence the way in which the psi function connects with expression ought to be the most profitable area of research conceivable for the years ahead.

Also, parapsychology will now need more than ever the more penetrating analysis of the spontaneous experiences in which nature offers her bargain counter of clues as to how psi operates. It is clear that something, indeed much, has been gained from fingering over the items on the counter, but we shall want to know if there is not more to be had. We shall need especially to be on the lookout for conditions favorable to the conversion of spi to recognizable experience, conditions that may be reproducible or at least culturable to a degree that extends the controllability.

The question of learning in psi performance is one that may gain

from this recognition of the need of translation in all forms of parapsychical manifestation. The familiar learning operations depend, of course, on sensorimotor functions, or direct experience and action. Psi learning, on the other hand, would have to depend on indirect exchanges that, as now understood, seem very unreliable indeed. There would be little use, as I think we can now see, in trying to make subjects "learn" in ESP performance as they do in behavior based on SP. It is true, learning can occur with submarginal consciousness of sensory perception, but what, indeed, is known of learning channeled through the devices of cognition which ESP must use? In the light of this background of better understanding the problem of learning in psi becomes a different one, though not a less important one: Can any sort of experience in any way intelligently and purposefully influence psi ability in its recurrent operation? May it be possible to learn to influence the "translation center" so as to avoid psi-missing, displacement, and other unintended consequences that enter into the result? This possibility could be cited as one example of the new direction the approach to "psi learning" might take.

Among the developments one may earnestly hope to see is that of a more experimental depth psychology—one that can provide us with more reliable knowledge concerning the "underground control rooms" in personality, where motivated judgments and conversions of various kinds are going on in both the well and the ill. In a number of characteristics parapsychology shares a long research frontier with psychopathology, although the boundary between them is a distinct one. One may safely say, however, that if psychopathology knew what its profession would like to know of the mental life behind its phenomena, parapsychology, like general psychology itself, could borrow heavily to its advantage.

For that matter, there is something to be gained even from the mere re-examination of the findings already in parapsychological journals. In fact, with every passing decade a systematic overhaul in all the main conceptions of a growing field is in order. Nothing can be allowed to remain unchallenged if there is progress on any frontier, for every shift of boundary lines is likely to create a need for realignment and apportionment throughout the whole domain.

ESP TESTS WITH FRENCH FIRST GRADE SCHOOL CHILDREN

By Christiane Vasse and Paul Vasse[1]

ABSTRACT: This is a report of clairvoyance tests made with first-grade pupils in a French school. One of the writers (C.V.) was the teacher of the pupils and the experimenter in the tests, while the other (P.V.) prepared the ESP targets for each day's test session. The writers shared the checking as a safeguard against errors.

The objective of the experiment was to find out if the teacher-pupil relationship, developed during the first year in school, is conducive to a high ESP performance. Three series of tests were made: the first near the end of the 1954-55 school year, the second at the beginning of the next school year, and the third at the end of the second year. All tests were conducted during the recess periods, and only those pupils who wished to give up their play activities were used as subjects.

Two kinds of target cards were used: five pictures drawn and selected by the children and the regular ESP symbols. There were two types of tests: a matching technique and one in which the cards were called "up through" the pack. Highly significant results were obtained with both procedures in the two series conducted near the end of the school year. However, the series conducted at the beginning of the year yielded scores that were below the chance average for three subjects and near it for two others.

The paper considers the special conditions which might have contributed to the successful ESP performance toward the end of the school year.—Ed.

Introduction

In the search for the factors that most affect the scores in psi-tests there is need to study both the differences in the subjects themselves and the external conditions of the tests. This report presents a research that deals with both, at least in an incidental way and on an exploratory level. The findings are offered for their suggestive value in an area now in special need of clarification, that of motivating the subject in an ESP test to more significant performance. The factors that were considered beyond this primary purpose of the experiment were questions that could be dealt with in

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only a limited way because of the small number of subjects involved.

The tests described in this report were conducted during the school years of 1954-55 and 1955-56. The subjects were pupils in the first grade of Chateaudun School in Amiens, France, and one of the writers (C.V.) was the classroom teacher and the principal experimenter. The experiment was divided into three series which occupied three periods of ESP testing during the two years. In the first year the work was confined to the second half of the school year (Series 1), and it extended from the end of March until the beginning of July. During the second year, tests were made with five pupils in the first two weeks of October (Series 2). The third period of testing (Series 3) was during the spring term, and it extended from June 4, 1956 through July 13, 1956.

Both of us have been actively interested in psi research for a number of years. C. V. was inspired to undertake these tests with the members of her first-grade class because of some observations she made upon the behavior of children of this age. The age of six years appeared to her to be a time when the child is readily affected by psychological conditions—for example the temporary disequilibrium caused by a sudden snowfall, by a family disturbance, by the onset of fever, or by a move from one house to another. That such an upset might be related to ESP scoring was suggested by a case of a child who scored 12 on an ESP test immediately after he had suddenly started to write backward ("mirror-writing"). This outstanding score, and the occurrence of mirror-writing in left-handed children more frequently than in right-handed ones, led to a special interest in the possible relationship between ESP test performance and the handedness of the subject.

The observation of changes which occurred in the children during the course of their first year in school also led to an interest in the possible relation between these developments and ESP success in the schoolroom situation. These first grade children enter school from different cultural backgrounds and up to this time their families have exerted the primary influences upon their lives. During their first year in school, however, the influence of the teacher and of the other children becomes important, and the formation as the year progresses of a cohesive group including teacher and class-

mates is the result. The circumstances which bring about this group cohesion seemed to us to represent increasingly favorable psychological conditions for successful ESP scoring. We were especially interested, therefore, in looking for opportunities to test children early and late in the school year in order to compare their ESP success at these two intervals.

The Experiment

Test Materials

We decided to conduct the ESP tests with randomized targets with a ⅕ probability basis, along lines that have become standard. During the first year, however, we did not have the regular ESP symbols. Accordingly, we decided to ask the children to participate in the development of the targets and to use this aspect of the planning of the experiment as an occasion for building up their interest in the ESP tests. In order to increase the motivation and group spirit of the class, all the pupils were asked to participate in the creation of a special pack of target cards. Forty children each made five drawings of objects that they liked. From the collection of two hundred drawings the class voted on the five kinds of drawings they preferred and then on the one specific drawing of each kind which was to represent the type. These five drawings—a man, a house, a train, a boat, and a flower—were then printed commercially on ordinary cards with a geometrical design on the back, or on half of one side of a double card which was then folded over to hide the drawing. Finally the cards were arranged in packs of 25 with five of each kind to a pack.

The target packs for each test day were prepared during the previous evening at home by P.V., who shuffled the pack of cards and then without looking at the symbols slipped each card into an opaque envelope with the face toward the seamless side of the envelope. Then he tucked in the flap of the envelope so that it overlapped the back of the card and thus enclosed it without having to seal the flap. The envelopes were only slightly larger than the cards themselves so that the cards fitted snugly inside. They were of a double thickness, the outside paper being white and the inner layer of a grey color which rendered them opaque. When the double cards were used these were put in with the fold toward the open

end of the envelope and the flap was tucked in over the card as usual. Each pack of envelopes with cards was then shuffled thoroughly and fastened together with a rubber band, ready to be picked up by C. V. when she departed for school the next morning.

Test Procedures

The tests were conducted with the first grade pupils during their play periods, and only those children who were interested enough in the ESP game to devote their recess to the tests were used as subjects. Two kinds of testing procedures were used: (1) an individual matching test, in which the the subject sorted the envelopes of the shuffled pack into five groups in the effort to match the enclosed cards to five exposed key cards; (2) a group test in which all the pupils attempted to call the "up through" order of a target pack of cards in the envelopes which the teacher had placed on her desk in view of the subjects. Insofar as could be done conveniently, each subject was allowed to choose the test which he preferred on days when both kinds of tests were made. More frequently however, only one procedure was used and all the subjects participated in the same test. Since the experiment was not designed primarily to make a comparison of different test procedures, no effort was made to divide each subject's participation evenly between the two kinds of tests nor to alternate the use of the two in a manner that would be necessary if a strict comparison of the results were a main objective.

Since the subjects were only first graders, everything possible was done to simplify the test procedures for them. A sheet of paper to which was attached cards showing the five objects used in each of the tests (the five pictures or the five ESP symbols) was placed on the blackboard and underneath each drawing was written the first letter of the object or the symbol for the child to copy when he made his calls. The children were given special seats in the classroom during the test so that they were unable to glance at one another's call records. In the group test the children who had difficulty writing their own calls came individually to C.V.'s side and indicated their responses by whispering in her ear or by pointing to one after another of the five stimulus cards placed on the experimenter's desk as a guide. By the end of the year most of the chil-

dren were capable of writing down their own guesses on their record sheets.

In the individual-target matching test, packs of the cards enclosed in envelopes were given to the child at the front of the room to match against the five target cards. Under the observation of C.V. or of the practice teacher who happened to be assigned to the class at the time, the child placed the cards in five groups, sorting them into shallow glass containers which were arranged on the table and each of which was marked by one of the key cards. Two general arrangements of the containers were used: they were either presented in a line in front of the subject or they were arranged around the edge of a circular wooden apparatus about 50 centimeters in diameter which the subject could turn while sorting the cards. During Series 1 about the same number of matching tests were made with each arrangement, but in Series 3 the children preferred the linear arrangement and used it almost exclusively.

In the matching tests the children were encouraged to place the card in the containers in their own way. Some of them placed down one envelope at a time, but it was interesting to observe that some of the subjects placed two or three cards at a time and then, as the run proceeded, they frequently went back to shift the cards from one container to another. The children looked upon the test as a game and they played it as such without strict routinization but with close supervision to see that they always held the envelope flat in their hands with the seamless side uppermost. No attempts to get a glimpse of the card inside the envelope were ever observed.

Because first grade children, even at the end of the year, still have difficulty with writing—they have not yet mastered the art of making their letters small and of staying within a designated space—no effort was made to use a printed form for the "up through" group test. Instead each child wrote on an ordinary sheet of paper and afterwards counted his calls to make sure that he had completed the test for the day. Then he wrote his name on his record. C.V., of course, checked to see that the record was in order at the time she collected the subject's calls at the end of the test.

After each test session C.V. collected the cards and records. In the matching tests, each of the key cards was placed on top of its

group of envelopes, the cards were then fastened together with a rubber band, and a slip with the subject's name was attached. C.V. kept the cards in her possession until they were taken home at the end of the school day for checking.

It is important for American readers to understand that French schoolroom routine is very strictly regulated, and that the teacher is not free to use any of the time during the regular school period for any purpose except that prescribed by the authorities. Thus there was no opportunity to do anything in the way of ESP testing and checking of the results at school, except what could be worked into the relatively brief recess periods. Even so, special permission had to be obtained before asking those children who wished to do so to stay in and take part in the experiment.

Checking Procedure

The results were checked jointly by both of us during the evening at home, each one carefully observing each step of the procedure. The method of checking the matching test results was to write down the first key card, then both of us observed while the cards in the group of envelopes belonging to that key were removed and the symbols recorded. This was repeated for the other key cards and groups of the run.

The method of checking the group-test results was as follows: Because of the irregular manner in which the calls were written, first of all the subjects' records were copied. P.V. read these off to C.V. who wrote them on a regular printed ESP record form. After all the subjects' calls for a given day had been recorded, P.V. then removed the rubber band from the target deck and read the cards one by one to C.V., starting with the bottom card of the pack, and at the same time showing her each symbol. C.V. meanwhile recorded the target cards, as she had earlier recorded the subjects' calls, on a separate ESP record form, while P.V. checked her accuracy of recording. The card record was then matched against the records of the children's calls for that day.

After each day's results were checked and recorded, P.V. alone shuffled the packs of cards and re-inserted them into envelopes. He then shuffled the envelopes and fastened them together with rubber bands in preparation for the test of the following day.

Upon meeting with the group of subjects on the day after a test, C.V. spoke encouragingly about the good results that had been obtained, and she gave all the subjects small candy rewards or small plastic toys for their good performance. The rewards were given not only to the subjects who obtained outstanding scores but to all who took part. Indeed, the subjects were not told what their scores had been, and no effort was made to explain the statistical aspects of the tests. They were encouraged to look upon the experiment as a game and to participate in it as something which was fun to do.

Results

A total of 466.5 runs were completed in all three series of the experiment. These results were contributed by 28 children who took part in Series 1 with a total of 271 runs and by 12 children who were subjects during the 1955-56 year (Series 2 and 3) with a total of 195.5 runs. Since the total results involve both individual tests and group tests which call for different methods of statistical treatment, it is not convenient to combine all the results in one over-all analysis and evaluation of the total. However, it may serve a useful purpose as an approximation to give a general statement of all the results, as a background against which the variations within the experiment, especially from series to series, can be better appreciated. The total of 466.5 runs (11,662 trials) yielded 2965 hits where 2332.4 is mean chance expectation. This represents a deviation of + 632.6, a general average of 6.36 hits per run (25.4% as compared with mean chance expectation, or M.C.E., of 20%). If the usual critical ratio (CR) evaluation is applied to this over-all result merely as an approximation, a CR of 14.6 is found, which would be statistically highly significant.

The individual tests are, of course, properly evaluated by the CR method, but the group tests require the use of a method of assessment which takes into account the fact that a number of subjects were making calls aimed at the same target pack and which avoids the assumption that the subjects' calls were not related to one another. The Greville method appropriate for such data (3) has been applied to the results of the present experiment.

The results of each series are presented separately because of their bearing upon the question of the effect of time of year upon ESP success. Table 1 shows the results of Series 1 for the two test procedures and in terms of the individual subjects, with subjects who completed not more than five runs being grouped together.

Table 1

Results of Series 1 (Spring, 1955)

Subject	Individual Tests				Group Tests			
	Runs	Dev.	Av. Run Score	% Hits	Runs	Dev.	Av. Run Score	% Hits
Benard	22	+ 16	5.73	22.9	6	− 2	4.67	18.7
Boulanger	21	+ 15	5.71	22.9	4	+ 3	5.75	23.0
Girard	11	+ 9	5.82	23.3	8	+22	7.75	31.0
Delabre	7	+ 11	6.57	26.3	2	0	5.00	20.0
Legvien	9	+ 13	6.44	25.8	4	+ 5	6.25	25.0
Grenon	24	+ 20	5.83	23.3	5	+ 9	6.80	27.2
Thierry	3	− 3	4.00	16.0	4	− 9	2.75	11.0
Dubreuil	14	+ 1	5.07	20.3	5	+ 5	6.00	24.0
Bauchet	10	− 13	3.70	14.8	3	+ 2	5.67	22.7
Caron	9	+ 1	5.11	20.4	6	+23	8.83	35.3
Morel	...	.....	....	....	5	+ 8	6.60	26.4
Vasse	5	− 5	4.00	16.0	7	+ 8	6.14	24.6
Masson	31	+ 44	6.39	25.5	8	− 2	4.75	19.0
Pechon	8	+ 5	5.63	22.5	8	+10	6.25	25.0
Miscl. (14)	11	− 2	4.83	19.3	11	+ 7	5.64	22.5
Total	185	+112	5.61	22.4	86	+89	6.03	24.1
	CR=4.12; P=.00004				CR(Greville)=4.49; P=.000007			

There were 14 subjects who are listed separately and 14 others are in the miscellaneous group. For each kind of test each subject's results are given by the number of runs, the deviation of hits from M.C.E., and the average run score, as well as the percentage of success. It is obvious at a glance that most of the percentages shown in Table 1 are above the chance level. When the individual tests as a whole for this period are evaluated they give a CR of 4.12, with $P = .00004$. The group tests of Series 1 were also strikingly successful. When each day's results were evaluated by the Greville method and all days were properly combined, they yield a CR of 4.49, with $P = .000007$. The subjects who took part in the tests of 1955-56 were, of course, members of another class of first-grade

children. French schools open the first of October, and the first tests were made during the first two weeks of school in order to collect data bearing on the question of the influence of *lack of schoolroom experience* upon ESP performance. That is, they were purposely tested shortly after the school year started and while the situation was still a strange one for them. The October tests (Series 2) were all group tests and they were made with only five pupils. The targets for this period were the picture cards that had been prepared for the tests of the preceding year. The results of these October tests were far less successful than those of Series 1. Indeed, three out of the five children gave rather striking evidence of negative scoring. The percentages of success for two of these subjects were 9.6% and 14.0% on 10 runs and 13.7% on 7 runs for the other. The remaining two subjects scored quite close to the expected 20% level (20.8% for one and 22% for the other). Unfortunately, after these results were summarized a fire in the schoolroom destroyed the original records and the experimenters have only the summaries for this report. It is not possible, therefore, to apply the Greville method of evaluation to these group-calling tests. If the usual CR method is used, the total results of these five subjects would be significantly below chance ($CR = 3.28$, $P = .001$). The results of Series 2 are shown in Table 2.

Table 2

RESULTS OF SERIES 2 (FALL, 1955-56 SCHOOL YEAR)

Subject	GROUP TESTS			
	Runs	Dev.	Av. Run Score	% Hits
Ibanez	10	−15	3.50	14.0
Lethenet	10	−26	2.40	9.6
Patte	10	+ 2	5.20	20.8
E. Leclercq	7	−11	3.43	13.7
Coussart	10	+ 5	5.50	22.0
Total	47	−45	4.04	16.2

Evaluation (approx.): CR = −3.28; P = .001

In Series 3 (June and July, 1956) both individual and group tests were made, as in Series 1. Only seven subjects took part in

individual tests, whereas all 12 participated in the group tests (two of these doing only three runs under both conditions between them).

Series 3 gave the highest level of scoring of the entire experiment. Among the 12 subjects who took part in this series were the five who had participated in Series 2 in October, 1955. The fact that these five subjects who had scored at or below M.C.E. at the beginning of the school year participated in the same kind of test in the spring with much higher percentages of success (between 34.2 and 37.8 percent) emphasizes the importance of the psychological conditions. The results of Series 3 are given in Table 3. The seven subjects who participated in the individual tests did a total of 45.5 runs with a deviation of + 131.6 hits. (The fractional part of a run included in the results is explained by the fact that one subject, after he had matched 12 cards of a pack, suddenly laid the rest down and said that he did not wish to do any more. The experimenter, preserving the informality under which the tests were done, did not try to persuade him. When the 12 cards that had been sorted were checked at home in the evening, they were found to contain 10 hits!) The individual tests alone are highly significant, with a CR of 9.76 and a $P < 10^{-20}$.

Table 3

Results of Series 3 (June-July, 1956)

Subject	Individual Tests				Group Tests			
	Runs	Dev.	Av. Run Score	% Hits	Runs	Dev.	Av. Run Score	% Hits
Ibanez	10.5	+ 40.6	8.86	35.5	11	+ 49	9.45	37.8
Lethenet	11	+ 28	7.55	30.2	10	+ 37	8.70	34.8
Patte	11	+ 41	8.73	34.9	11	+ 39	8.55	34.2
E. Leclercq	3	+ 16	10.33	41.3	10	+ 39	8.90	35.6
Coussart	4	0	5.00	20.0	11	+ 42	8.82	35.3
Monchaux	5	+ 7	6.40	25.6	10	+ 26	7.60	30.4
Bocquet	....	.....	....	....	10	+ 30	8.00	32.0
Duquesnoy	....	.....	....	....	9	+ 37	9.11	36.4
Cordier	....	.....	....	....	9	+ 21	7.33	29.3
Corbier	....	.....	....	....	9	+ 18	7.00	28.0
Miscl. (2)	1	− 1	4.00	16.0	3	+ 7	7.33	29.3
Total	45.5	+131.6	7.89	31.6	103	+345	8.35	33.4
	CR = 9.76; $P < 10^{-20}$				CR(Greville) = 14.48; $P < 10^{-40}$			

The 12 subjects who participated in the group "up through" test completed a total of 103 runs with a deviation of + 345 hits. These group-calling results evaluated by the Greville method yield a highly significant CR of 14.48, with $P < 10^{-40}$.

There was no appreciable difference between the rate of scoring for the matching tests and the group tests (31.6% and 33.4%, respectively).

Incidental Results

(a) *Right and left-handedness in relation to ESP.* The experimenters' interest in this question was enhanced by the fact that there were a number of left-handed pupils among those who volunteered for the first tests. Among those pupils who remained interested and worked until the end of the series, six were right-handed and eight left-handed. While these numbers are rather small for a statistical test based on the *subject,* the proper unit of observation, it is interesting to note in passing that there was no significant difference between the total scores of the right and left-handed subjects, though the left-handed ones had a slightly higher percentage of success (24.68%) than did the right-handed subjects (22.92%). Thus the experimenter's impression that the left-handed subjects might do appreciably better was not borne out to any appreciable degree by the results.

(b) *The comparison of picture cards and ESP cards.* In Series 3 (June and July, 1956) the group tests were done to approximately the same degree with the picture target cards prepared by the children the previous year and with regular ESP test cards. Of the total of 103 group-test runs, 40 were made with ESP cards with a 32.4% level of success while 63 were done with the children's cards with a 33.8% success level. The difference between the two kinds of symbols is not significant. The ESP cards were also used in a small number of runs for the matching tests, and in that test they also gave the same level of success as the picture cards.

(c) *Intelligence level of subjects and ESP performance.* The 12 subjects who participated in Series 3 had taken an intelligence test in the classroom earlier in the year. On this basis they were separated into two groups, those above 100 IQ and those below 100 IQ. Again, the 12 subjects are the proper statistical units of ob-

servation, and they are not as many as would be desirable for an adequate study of the relationship of ESP performance to intelligence. Nevertheless it is interesting to see that the higher IQ group on the basis of 99 runs with both individual and group tests achieved a 33.86% level of scoring, whereas the subjects with IQ below 100 in 46 runs achieved a 30.17% success level. The difference is at least suggestive of better ESP performance on the part of subjects with higher intelligence test ratings, and it is sufficient to note that this is in line with the trend found in previous studies dealing with this question (2).

Discussion

There are two main questions to be considered. One is that of how definitely the results may be regarded from the point of view of evidence of ESP. The second is that of the interpretation of the findings as bearing upon the primary objective of the experiment: the investigation of the psychological conditions favoring ESP success. The experiment was characterized in the introduction as an exploratory one and this applies to both aspects of the interpretation of the results, but in a quite different way.

From the point of view of evidence of ESP, it is obvious first of all, that the results are statistically significant to a degree that rendered the chance hypothesis unreasonable. Were the conditions of the experiment such as to exclude other counter hypotheses, namely, sensory cues or recording and checking errors? On this point it may be said that the precautions taken were more than would ordinarily be required in any other kind of psychological experiment. The shuffling of the cards both before and after they were placed in the envelopes was sufficient to insure a random order of targets, and the manner of closing the envelopes and allowing the children to use them only under the close supervision of an experimenter provided adequate precautions against sensory cues. The method of recording and checking the data with both experimenters present and watching each stage of this process is beyond the common safeguards. However, we recognize that our procedures did not provide the same measure of safeguarding against recording and checking errors as the most advanced two-experimenter investigations in paraspychology. We were not attempting to undertake a

confirmatory test, but only wished to see if results could be obtained which would lend support to our ideas regarding the importance of the fully-developed social and psychological situation of the classroom as a favorable one for ESP performance. Under the circumstances, it would have served no purpose to incorporate a more elaborate two-experimenter design.

Even so, the conditions of the experiment make it unlikely that recording and checking errors could account for the results. Except for the data which were destroyed in the schoolroom fire (Series 2), the original records are available and they have been rechecked. Since the experimenters transcribed the children's call records before the target deck was written down it is difficult to see how any sort of motivated recording errors could have been made. These would necessarily have been restricted to the target deck and they could scarcely have taken place in a way that would account for high scoring on each day by most of the subjects.

As an exploratory experiment, the results may be said to offer good evidence for the occurrence of ESP. We may therefore proceed to the discussion of the second question of what suggestive bearing the conditions have upon the question of the conditions favoring the occurence of ESP.

It is obvious, of course, that the significant results were obtained in Series 1 and 3, those tests which were done near the end of the school year after the children had become well acquainted with one another and with the teacher. By contrast the experiment done at the beginning of the school year gave results closer to chance with even a strong suggestion of negative scoring. Does this mean that the end of the first year of school is in itself a sufficient condition for obtaining significant ESP scores? The answer to this question is almost certainly in the negative. We must recognize that the teacher and principal experimenter *expected* that the results would be better in the spring. It follows that she might have allowed herself, even unconsciously, to try harder to motivate the children favorably at that time of the year than she did at the beginning of school. Aside from the possibility of such unconscious motivation in the experimenter, C.V. clearly recognized the fact that the classroom requirements at the beginning of school were much heavier

both upon herself and upon the pupils. There were many psychological tests to be made, many difficult adjustments which required the teacher's time, and attention that had to be given to other matters of a merely routine kind. These things, all together, may have prevented the teacher from explaining the tests to the pupils in October with the same care and in the inspiring manner which she attempted to use in the spring. The first result can only be taken, therefore, as pointing to the need for further work comparing different times of the year and for adding the warning that the aspects of the conditions which make interpretation difficult in the present case can only be eliminated by careful planning in further experiments bearing on this question.

But, aside from the contrast in ESP scoring between the opening and the end of the school year, the fact remains that the subjects who worked in the two spring series did remarkably well in their tests. It is worthwhile, therefore, to discuss the conditions of the experiment and general impressions formed by the experimenter in observing the children at work for clues as to why so many of the children did as well as they did.

The experimenter took as much time as she felt could profitably be used in introducing the tests to the children before starting the spring series. Before Series 1 for example, the experiments were described, being presented as a game which the children could play, and they were asked first if they would like to use animal pictures in the game (such as those that had been used in the Soal experiment). The children did not like these pictures and then the experimenter struck upon the idea of having the children develop their own ESP targets in the manner previously described. In the course of drawing and selecting the five target pictures a very strong group interest in the project was developed and it seemed likely that this played an important part in the general success of the test. In anticipation of Series 3 the following spring C.V. recognized that it would be financially difficult to start all over and develop new cards to be printed. She therefore took the approach of describing the experiment of the preceding year to the children, talking about the cards in such a manner that the pupils were led to feel that these cards also belonged to them.

It must be recognized, however, that if the method of developing the cards engendered favorable interest on the part of the subjects it must have been one which was easily tranferred to another type of symbol. For when during Series 2 the group tests were done on several days with ESP cards the subjects immediately began scoring at the same general level of success as that which they attained in the tests with picture cards. It seems likely therefore that the important factors were not limited to the use of any particular kind of test material but were rather generally favorable psychological conditions which induced high scoring in most of the subjects. Undoubtedly an important consideration not to be lost sight of is the children's really wanting to take part in the tests: they regarded them as a game and desired to participate even to the point of giving up their highly valued play time on the school ground. One of the main features of the experiment was the informality and degree of freedom permitted to everyone. No child was urged to take part, but all who did so were present because they wanted to play the game. Thus, in Series 3 only 12 pupils out of a class of 45 chose to participate and only 10 of these 12 to any considerable extent. Even when a child preferred to stay at the beginning of a test period and later asked to be allowed to go outside for the remainder of the recess he was freely allowed to do so. We have seen how in one instance this happened after only 12 trials of a run, and the child was later found to have obtained 10 hits.

The children gave clear behavioral signs of the intensity with which they took the test. One child after completing a run wet himself, which he never did in the schoolroom on any other occasion. The children showed their strong desire for success by perspiring and becoming flushed and tense. It was the impression of C.V. that the children who were less successful were also disturbed to a lesser degree. They did not seem to be anxious about what they were doing.

Not only was the behavior of individual subjects of interest, but also the behavior of the participants in the experiment as a group is interesting in relation to the question of the psychological conditions. The pupils who volunteered for the ESP tests developed a strong group spirit among themselves. They shared a feeling of pride in

their participation in the "card game," and became a closely-knit group bound by strong sentiments of friendship within the class.

This group, it should be said, included not only the subjects but the experimenter as well. Some of the pupils have maintained until the present time the strong friendships which had their beginning in the participation in the experiment and also frequently seek out the teacher in the school and speak to her about the wonderful time they had together in the ESP tests. It is reasonable to think therefore that the experiment was genuinely a high point in the lives of the subjects.

Since this experiment is primarily important for its relevance to the general problem of the experimenter-subject relation in successful psi testing, and since this relationship was in the present research based upon an existing teacher-pupil situation, a few remarks regarding C.V.'s background and role are in order. She had been a high school teacher some years before but had interrupted her career after her marriage to P.V., a medical doctor in general practice. During the seven years when she did not teach, she developed her interest in parapsychology and general psychology. When she decided to return to classroom teaching it was because their six-year old daughter was starting school. C.V. requested a position with the first grade because of the child as well as for convenience: the school was only across the street from the home.

In France it is very unusual for the wife of a physician to work outside the home. C.V. was teaching because she very much wanted to. She therefore had a number of reasons for wishing to be as successful as possible in her work in the school. As a result, she applied herself to the task and to the children with devotion and with a freshness of interest arising from the long period of freedom from classroom routines. C.V. felt that successful teaching required both the development of a strong class spirit and the winning of the personal friendship of the pupils, and she was conscious of the fact that these aims were only realized gradually as the school year progressed. In a psychological sense, therefore, the five pupils who took part in both the October, 1955, and the June-July, 1956, tests were *not* the same people at these two times. Altogether, the indications both from the point of view of the individuals as well as from

that of the group, are that the pupils who took the test were raised to a high level of motivation based upon a strong interest in the experiment and a desire to succeed in the unusual task which their friend, the teacher, had explained to them and which they had freely chosen to do.

At the time this work was started, the experimenters knew about van Busschbach's GESP tests in the schoolroom (**4**). The work of Anderson and White (**1**) relating ESP to pupil-teacher attitudes had not yet begun. It is interesting to observe that our own results show a basic similarity to the findings of these other investigators, not only in that all found significant evidence of ESP in the classroom situation, but also there were indications from all that the psychological conditions had an important bearing upon the success of the tests. Indeed, the most recent report by Anderson and White (published in this issue of the *Journal*) deals with ESP tests made at the beginning and at the end of a school term, and the trend which they observed was similar to that found by us: a higher level of ESP scoring after the teacher and pupils had become well acquainted with one another.

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CORRELATION BETWEEN ESP AND RELIGIOUS VALUE[1]

By CARROLL B. NASH

ABSTRACT: With several purposes in mind a series of ESP tests was made on subjects from an adult class in parapsychology. Only two of the objectives tested for, however, yielded results of interest. These were, first, the attempt to correlate the subjects' prediction of their scores with the actual results, and second, to correlate their ESP scores with a psychological questionnaire designed to indicate certain "religious values."

The total results were not significant, but when considered alone a significant negative correlation was reached on the subjects' prediction of their scores. Positive indications were secured on the "religious value" correlation, and the results are offered as justifying further study along this line.—Ed.

THE EXPERIMENT reported was performed in the author's course in parapsychology presented by the Main Line School Night Association. This was a course for adults which was conducted for 90 minutes on each of 10 consecutive Monday evenings from February to April, 1957, and again during 10 Monday evenings from October to December of that year. An ESP test was performed each evening approximately midway through the class.

FIRST SERIES

The test each evening was made up of one run of 20 calls. The 20 targets for these calls were written on a ruled two-inch by five-inch card in two columns of 10, each target being one of the digits from 0 to 9. A different set of targets was used for each of the 10 sessions of the series. A card in which holes were cut was attached to the target card so that only alternate targets within the two columns were exposed. The digits in the odd-numbered positions of the two columns and those in the even-numbered positions were exposed during alternate sessions. The 10 covered spaces on each card were filled with a randomly selected permutation of the digits 0-9, and the 10 uncovered spaces by another randomly selected permutation of the same 10 digits.

[1] This research was supported by a grant from the Parapsychology Foundation, Inc.

During the test, the agent (C.B.N.) was alone on the stage of the auditorium with the target card on the lectern before him. The uncovered targets, which were not seen by the agent until immediately before the run, provided a test of GESP. The covered targets provided a test of clairvoyance since they were not seen by the agent until after the run. The subjects were not told what the targets were although they were informed of their scores in the succeeding class.

The subjects wrote their 20 calls in two columns of 10 on a ruled two-inch by five-inch card. They were told that the targets were made up of the digits 0-9 and that some were covered and some uncovered, but they were not informed that each of the digits was used only once in a covered and once in an uncovered space. The subject placed his name and the date on the top line of the call card and was asked to list whether he thought his score for the session would be above average, average, or below average and whether his mood was pleasurable, neutral, or unpleasurable.

At the beginning of the series, the subjects were asked to indicate whether they believed ESP to be possible. They were also requested to list the month and day of their birth. Seventy-seven of the 135 subjects participating in the First Series completed a personality test, the Allport, Vernon, and Lindzey "Study of Values" (2) which indicates the relative strength of six motives to the testee: theoretical, economic, aesthetic, social, political, and religious.

The results of the experiment were independently checked. There was a total of 735 runs with the 135 subjects, making an average of approximately 5.5 runs per subject. In the GESP part of the experiment there were 739 hits, and in the clairvoyance, 733, with deviations of $+4$ and -2, respectively, which are not significant. The analysis of the results in relation to the subject's attitudes of belief in ESP, time of birth, and mood at the time of taking the test yielded nothing of interest.

The expected and the actual number of runs with scores above and below mean chance expectancy for the three categories of predicted score (above average, average, and below average) are presented in Table 1. The chi-square for each cell is in parentheses. The sum of the chi-squares is 9.67, which, with two degrees of

freedom, has a probability of less than 0.01. The greater part of the significance is contributed by the two upper cells in the table, and it is due to the fact that there was an inverse relation between the prediction of above-chance scoring and the scores actually obtained. Presumably, this result has some connection with psi-missing—it seems as if the prediction of a high score caused the subject to get a low one.

Table 1

SUBJECTS' ACTUAL SCORING LEVEL IN RELATION TO PREDICTED SCORES

Predicted Score	Observed Session Scores: Above M. C. E.	Observed Session Scores: Below M. C. E.	Total
Above M. C. E.	17 (4.34)	45 (3.58)	62
At M. C. E.	144 (.82)	167 (.68)	311
Below M. C. E.	63 (.14)	70 (.11)	133
Total	224	282	506

$x^2=9.67$ (2 d.f.)
$P<.01$

In order to determine more precisely whether the individual subject's level of ESP scoring and his prediction of success varied together, each subject's ESP score in each session was classified as being above or below his own over-all average for the series, and further separated according to whether he predicted an above- or below-average score. The results evaluated by the chi-square test are presented in Table 2. The chi-square value is 6.57, which, with one degree of freedom, has a probability of less than 0.01. These two analyses are not independent of each other, but together they suggest a relationship between the observed and predicted run scores of the subject.

The six values of the "Study of Values" were examined in a general way in relation to the ESP scores. None except the religious values yielded suggestive results. It seemed possible that there might be a relation between religious values and ESP, since

Table 2

VARIATION OF INDIVIDUAL SUBJECT'S SCORES IN RELATION TO PREDICTION OF SUCCESS

Predicted Scores	Individual's Session Score: Above His Average	Individual's Session Score: Below His Average	
Above M. C. E.	25	51	76
Below M. C. E.	82	80	162
	107	131	248

$\chi^2 = 6.57$ (1 d.f.)
$P < .01$

there appeared to be a tendency for subjects to score high or low on both. A second series was therefore carried out to get more evidence on this point.

SECOND SERIES

During these tests, the experimenter stood in front of the class holding the target card so that he alone and none of the subjects could see the targets written on it. As in the First Series, there were 20 targets in two columns of 10, each target being a digit from 0 to 9. Only alternate targets were written on the card before the test, and these constituted a test of GESP. The other targets were written on the target card after the close of the N.Y. Stock Market on the succeeding day, and they constituted a test of precognition. The closing Dow Jones Railroad Average of the succeeding day was used as the line number in a table of random numbers (1) from which the target digits were selected in chronological order except that each digit from 0-9 was used only once. This was also true of the GESP test. The subjects were told that some of the targets would be filled in at a later time. As before, the targets were not disclosed to them, although they were informed of their scores at the next meeting of the class.

In the 10 runs of the series there was a total of 264 runs with the 53 subjects, an average of approximately five runs per subject. There were 249 hits on GESP and 284 hits on precognition, with

deviations of − 15 and +20, respectively, which are not significant.

Twenty-six of the 53 subjects completed the "Study of Values." The religious value category was given separate analysis. In order to check on the relationship between this category and ESP, the coefficient of correlation between the scores of religious value and the average run scores of the total ESP data was determined. Whereas this figure was insignificant for each of the two series considered separately, the value of r for the two series taken together was found to be + 0.282, which, with 103 subjects, has a P of less than 0.005. As the results of the First Series, which contributed to this figure, were not predicted, they can of course have only suggestive value. However, the fact that the difference in total ESP scores associated with differences in religious value in the First Series was repeated in the Second Series is an additional indication that there is a relation between ESP and religious value as measured by this test.

The values of the r's between religious value and ESP are presented in Table 3 for each of the several numbers of runs per subject that occurred. An increase in the value of the coefficient of correlation is seen to accompany an increase in the number of runs between 6 and 10. Below 6 runs, too few subjects were tested to provide a reliable index. The reliability of the correlation coefficient between ESP and religous value is augmented by its direct variation with the number of runs per subject.

Table 3

CORRELATION BETWEEN RELIGIOUS VALUE AND ESP FOR VARIOUS NUMBERS OF RUNS PER SUBJECT

Number of Runs per Subject	Frequency	r
10	21	+0.456
9	21	+0.437
8	22	+0.149
7	13	+0.050
6	16	+0.005
5	3	+0.165
4	5	−0.850
3	1	.....
2	0	.....
1	1	.....
Total Data	103	+0.282

According to the authors of the "Study of Values," "the highest value of the religious man may be called *unity*. He is mystical, and seeks to comprehend the cosmos as a whole, to relate himself to its embracing totality." The existence of a relationship between these two factors—unity, as shown by the questionnaire, and ESP—is one that requires further investigation: first of all to see if it will be confirmed; and if it is, to try to throw light upon its nature.[2]

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[2] The statistical editors have pointed out that the "stacking" effect (due to having several subjects call the same target order) would affect the chi square and correlation analyses. It seems likely that the degree to which these measures have been influenced is a slight one. However, it is important to emphasize once more the exploratory character of this research.

COMMENTS AND LETTERS

Further Comment on "Wishing with Dice"[1]

[The author presents here a rejoinder to the criticism by Dr. L. G. Humphreys of the paper "Wishing with Dice." Both the paper and Dr. Humphreys' criticism appeared in the *Journal of Experimental Psychology.* The rejoinder given here by Dr. McConnell was offered for publication in the same journal but was not accepted. It appears below in the form in which Dr. Humphreys recommended it should be published in that journal. The author has stated that he will be glad to send reprints of "Wishing with Dice" (2) and Dr. Humphreys' criticism (1) to research workers who are interested but who do not have copies.—Ed.]

The detailed and thoughtful analysis (1) given to our paper (2), implies a recognition that the statistical effects which we found, if real and of psychological origin, are a fundamental challenge to current psychological thinking. It is Dr. Humphreys' thesis (a) that our data may well be of entirely chance origin, (b) that a curious regularity is apparent when our data are aggregated in a particular way, and (c) that, in any case, the departures from chance expectation are suspiciously non-psychological in their detailed characteristics. These points will be discussed separately.

Are the data extrachance?

Dr. Humphreys says: "One should not accept differences . . . in the expected direction at a given level of significance as non-chance and reject differences in the unexpected direction at the same significance level as chance. If this rule is followed, there are no positive results in the experiment."

To a casual reader this might suggest (as indeed it did to several readers of our acquaintance) that the main effect and interaction

[1] This paper is listed as Publication No. 46 in the Biophysics Department of the University of Pittsburgh.

effects, being of opposite sign, would "cancel" one another. This, of course, is not true. Dr. Humphreys meant only that one should, as a matter of consistency, regard both effects as meaningful or both effects as of chance origin, but not arbitrarily accept one and reject the other.

As a general principle applied to equally probable events this is sound, but there are reasons to question its applicability here. Are the two effects significant at approximately the same level of chance probability, as he implies?

In the analysis of experimental data there may be several statistical methods, all of which are technically correct, and each of which has its peculiar advantages. As explained in our paper, we were compelled by precedent to use a particular procedure in measuring the decline effect. We believe that the resulting chance probability of .002 is the proper measure of the degree to which our experiment showed the decline effect that others have found before us. In this connection two points need to be emphasized: Our probability evaluation concerns only the narrow question of the occurrence of a decline effect in association with the wishing of the subject; it does not reveal or measure the psychological nature of that decline effect. Secondly, since our method of analyzing for a decline effect was chosen by previous experimenters for its sensitivity (as well as for its simplicity and general applicability), it is not surprising that it is a more sensitive indicator of the effect than is the analysis of variance proposed by Dr. Humphreys.

ARE THE INTERACTIONS MEANINGFUL?

We agree with Dr. Humphreys that an analysis of variance is the proper tool for an *exploratory* investigation of these data. But if he is hunting for a decline effect, he should follow to a logical conclusion his statement that "there is some precedent for selecting one particular source of variation for test." The sum of squares which in his Table I is associated with data block positions (2 degrees of freedom) should be resolved into its linear and quadratic components. Only the linear component is a measure of the decline within the half-page. This was done in our original paper, although a probability figure was not given since the method of analysis is

exploratory. The mean square associated with the linear degree of freedom is 1.027, yielding an F of 7.42, and a chance probability of .0065. The probabilities associated with the interactions starred by Dr. Humphreys in Table 1 are .017 and .019 respectively, falling somewhat short of the .01 level of significance.

There is still another reason for drawing a distinction between main effect and interactions when assessing their reality. The decline effect was specifically sought and the computed chance probability of its occurrence may be taken at face value. The interaction effects are the unexpected result of analytical exploration and to their probabilities one must apply some sort of correction for selection from among the other non-significant analyses. This is a point that has been repeatedly emphasized by the critics of parapsychological research, and it should not be necessary to elaborate upon it further.

Although, for the reasons just given, we cannot acknowledge the dilemma which Dr. Humphreys offers, namely, that the interactions should be regarded as meaningful if the decline effect is so regarded, nevertheless, we do agree that the interaction probabilities are small enough to deserve a careful scrutiny. But we would like to carry our examination one step further than he did. The regularity represented by the questionable interactions can best be exhibited by taking the ratio of the first line to the second line in each of the columns in the top two-thirds of Dr. Humphreys' Table 2. For the halves-by-blocks interaction the ratios are 1.021, 1.022, 1.018; and for the halves-by-pages, 1.022, 1.022, 1.017, with an expected standard deviation of .019 for each ratio. We have puzzled over this unexpected uniformity at some length, and are inclined to reject the one possible explanation which Dr. Humphreys thinks most likely, namely, that there were systematic experimental errors.

Since there is no established basis for claiming this uniformity as part of a psychokinetic effect, Dr. Humphreys postulates an unknown mechanism by which the unexpected regularity is artificially created in the data. Then he supposes that if such a mechanism exists it may also be the cause of the decline effect which we have otherwise offered as evidence of psychokinesis. A weakness in this

speculation is apparent if one asks: "How might a mechanism which creates regularities in the ratios between certain top-of-page and bottom-of-page scores also create the observed decline effect?"

Our reasoning here stems in part from information not available to Dr. Humphreys. It should be noted that what needs to be explained as far as the interactions are concerned is a variance that is too small rather than too large—excessive regularity rather than excessive variation. On the other hand, the decline effect represents a variance excess. In general, the creation of excess variance in one category at the expense of another category can be accomplished by a selective interchange of data. Presumably what we are looking for in this case is a data exchange mechanism capable of creating the interactions and the decline.

In order to observe the suspicious uniformities represented by the interactions one must aggregate the data in the particular ways shown in the top two-thirds of Dr. Humphreys' Table 2—no other aggregations will do. For example, when one takes the same ratio without aggregation (top score to bottom score in our Table 1), the results scatter in an entirely chance fashion, to wit: 1.046, 994, 1.026, .988, 1.078, 1.005, 1.030, .998, 1.023. It follows that the meaningful creation of the questioned uniformities must involve the same aggregations of the data, either actually or virtually. But these aggregations of data are highly artificial from the experimental point of view and could not accidentally occur except in the data handling. Now in the recording of the data and in their subsequent processing, ***no combination whatsoever*** of data from the 18 separate data blocks ever occurred up to the point of completing Table 1 of our original paper. The data handling process is described in some detail in the supplementary information that we filed with the American Documentation Institute. Nothing need be added except an explicit confirmation of the fact that data block totals were individually punched into IBM cards (in the IBM analysis) with separate columns assigned to each of the 18 data block positions. The order of the card columns was the normal reading order of the entries in our Table 1, with the understanding that all of the "Page 1" entries precede all of the "Page 2" entries, etc.

In addition to the IBM analysis there was, of course, the independent manual analysis of photographic records. There have also been several other unmentioned compilations starting with the original hand-written data sheets, which independently confirm the finding of a decline effect while offering no apparent opportunity for the creation of the interaction effects.

We are at a loss to conceive of any way in which the interactions could be generated as an experimentally caused concomitant of the decline effect regardless of whether the latter was created accidentally or even by deliberate fraud. Under the circumstances we prefer the hypothesis that these unexpected but suggestively significant interactions are of chance origin.[2]

ARE THE DATA "NON-PSYCHOLOGICAL"?

Dr. Humphreys' position is shown by the following passages: "In the usual psychological experiment . . . all dependent variables measured with non-zero reliability exhibit significant individual differences; i.e., the ratio of the between-subjects variance to the within-variance will be greater than unity. . . . Lack of significant individual differences . . . is an indirect though conclusive indication that a phenomenon is not genuinely psychological."

There are two reasons to question the relevance of these statements to the data of our paper. First, these statements are true of the model population but not of the sample; i.e., a sample of given size may be too small to show a significant intersubject variance although large enough to show a highly significant main effect. Secondly, Humphreys assumes that the psychokinetic effect, if real, was caused by the 393 subjects whom we tested. In our paper we said "The procedure was one in which the experimenter was present and aware of the target number. Thus, the word 'subject' is used provisionally or in a nominal sense"; i.e., we cannot rule out the possibility that the decline effect may have been partially or entirely caused by the

[2] It is perhaps worth noting that if psychokinesis operates through an "ordering of existing causal factors," one would expect some variance components to be smaller than the chance value.

experimenters. Thus, the model which Dr. Humphreys uses relates to a hypothesis which we could not claim to have tested.

Contrary to the import of his statement on p. 292, we did not assume the homogeneity of the several error variances (Table 3) associated with his model. In computing the chance probability of the decline effect we examined the distribution of first-last data-block differences in the page. A chi-square goodness-of-fit test against a normal distribution with theoretical chance mean and standard deviation showed a chance probability of .21. Against observed statistics, the probability would have been larger. (This test was carried out from an independent tabulation. See the above aggregation argument.) The *F*-test which we used assumes the substantial normality of those differences (and by implication, their substantial homogeneity for all possible classifications, including that by subject).

While we welcome the testing of data such as ours against any reasonable model—and Dr. Humphreys' is certainly reasonable—we think it is methodologically improper to draw conclusions, however tentative, from the negative findings of such tests. When the defining characteristics of a purported phenomenon clash with our fundamental scientific expectations, as in the case of psychokinesis, no one can say what the supplementary characteristics of the phenomenon "ought to be."

Dr. Humphreys finds our data puzzling; so do we. If he thinks there may be experimental errors, we shall be pleased to provide him or any competent scientist an opportunity to examine our records and discuss our procedures.

He has made one suggestion in which we fully concur. Our work should be repeated—not in simple replication, for it must be remembered that our work is already a validation of similar work by others. We hope that any psychologist who wants to investigate psychokinesis will begin by studying the literature and will then conduct his experiment with such modest modifications of technique as may be expected to extend our understanding without losing the phenomenon altogether.

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A PRACTICAL APPLICATION OF PRECOGNITION

Several experimenters report that they have obtained runs of guesses showing a significant relation to a set of targets in the future. It follows logically that such an experiment, if successful and if sufficiently extensive, may be used to transmit information on any subject from the future to the present. To do this all that is required is to arrange a simple code with the experimenter who will set up the targets in the future.

For test purposes it would be convenient to look for some information regarding future events which will soon become common knowledge but is now unknown to and uninferable by anyone. A detailed aspect of the weather a few days in the future meets this requirement, and it has the further advantage of having been used in ESP experiments before.

Suppose one carries out a modification of the Rhine "weather cut" experiments. The subject would be asked to guess the order of cards in shuffled packs as they will be when cut according to a temperature reading to be printed on a given day in a given newspaper next week. The tests would differ from Rhine's in that the experimenter beforehand has assigned a temperature figure to each series. Thus he can know what the card order will be for any given temperature value and he can proceed immediately to cut the packs and then to check the subject's guesses against all the target series. If the guesses show a significant relation to one of the series, the experimenter will predict that the associated temperature figure will obtain on the day in question. For instance, when the guesses

are matched with the target series for 86° the score should differ in a more striking way from chance expectation if this is the correct temperature for that day than when matched with the series for the other possible temperatures.

A successful prediction of this type would be decisive evidence for precognition in the minds of many of the skeptics and might lead to extensive practical applications. The predictions are, of course, subject to the variation and error inherent in all predictions based on probabilty, but if they are found to be much less accurate than expected from the calculated odds-against-chance of the score on which they are based, a limitation in probability theory (or in our knowledge of how precognition operates) would be indicated. On the other hand, continued failure to get any score sufficiently significant to justify a sound prediction would indicate precognition does not work for this subject under the conditions in question.

The experiment described above is designed for clarity and might be cumbersome in actual operation. The author would be much interested in corresponding with anyone planning an actual precognition experiment.

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A NOTE ON THE EXPERIMENTAL INBREEDING OF PSI-ABILITY

If the possibility of animal psi can be taken at all seriously, and if hereditary individual differences in psi-ability can be hypothecated, then it is sensible to attempt experimental inbreeding of psi-ability. If psi can be conceived of as a process of nervous tissue (and it is difficult to suppose otherwise) then many of the techniques of genetics may be used to investigate and develop psi-ability.

Perhaps psi-ability did not evolve as a keen and preëminent capacity among the fauna of our planet because given the structure of our world effective eyes and ears were superior for survival. Per-

haps if environmental conditions had been different psi would have taken a more central position.

There is little difficulty in inventing an experimental world for a population of animals in which psi-ability is put at an evolutionary premium. Any experimental world would suffice for this purpose where the life and death of each specific individual member (and hence opportunity to breed and transmit gene structure) is determined at some crucial point by a combination of chance and psi-ability.

For example, the common fruit-fly, Drosophila, might be chosen as a convenient species. The animal breeds very quickly and relatively little space is needed for populations of many millions. A workable procedure for such an experiment with Drosophila is easily outlined. Three large tanks may be outfitted to connect with one another or be sealed. Adult Drosophila are placed in one of the tanks which is sealed from the other two. After the animals breed, the two remaining tanks are opened with plentiful food for the new generation. After a prearranged time all tanks are again sealed. All of the animals in the original tank and in one of the two feeder tanks (randomly determined) are destroyed. The animals in the remaining tank are allowed to breed a third generation which is then subjected to the same procedure.

In such an experiment little may happen for perhaps a hundred generations of millions of organisms each. If psi-ability can develop, however, there should be a slight but inexorable tendency for an ever-increasing percentage of organisms to "choose" the correct tank. Perhaps many years would be needed to observe this occurrence. It may be that psi-ability is a trifling statistical tendency but the evolutionary process is built upon such trifling selective factors. Given enough time and enough organisms there may be at first only the vaguest whisper of a capacity but in the end a near-perfect mechanism.

It may be that psi can become a function of nervous tissue only after there is a certain degree of nervous complexity; perhaps dim-witted creatures such as insects could never attain it. This note, however, is not concerned with one specific experiment but rather with a line of investigation and with its logic. If attempts at ex-

perimental inbreeding of psi-ability were to succeed, the theoretical and practical consequences would be of profound importance. This line of investigation is suggested by the present writer in the hope that a number of investigators might pursue its intriguing possibilities.

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BOOK REVIEW

ESP AND PERSONALITY PATTERNS. By Gertrude Raffel Schmeidler and R. A. McConnell (with preface by Gardner Murphy). New Haven: Yale University Press; and London: Oxford University Press. 1958. xiii + 136 pp. $4.00.

This is a welcome addition to the number of books in parapsychology in which an extended piece of research previously reported in various articles in journals is brought together and looked at as a whole. In importance, though not in length, it is comparable with Soal and Bateman's *Modern Experiments in Telepathy*. In the present case, the research is that of Dr. Schmeidler which started as a study of the difference between the scoring rates of those who believed and those who did not believe in the possibility of ESP and which subsequently ramified into a more general inquiry into the personality correlates of ESP ability. Dr. McConnell has brought his knowledge of experimental methods and of the use of statistical methods to bear on the problem of effective presentation of these results. The combined authorship has succeeded in making an informative, interesting and authoritative account of this research.

The authors have not tried to make this a textbook on parapsychological research into personality. There is, for example, only passing reference to the important Humphrey-Nicol studies of the personality correlates of ESP success. Such limitation by the authors was probably necessary in order to give a clear picture of the New York research in the space of a short book. Perhaps the time for a comprehensive survey of what has been done in this field has not yet come; the authors of this book make it clear that there are many suggestions which open up paths for future exploration and in another ten years' time the matter may be much clearer.

The finding of the present research which is best known is probably Dr. Schmeidler's discovery that the "sheep," who believed in the possibility of ESP, tended to score above chance while the "goats," who disbelieved, tended to score at or somewhat below chance level. This was confirmed in a series of experiments, some individual and some group experiments, and it can safely be regarded

as an established finding under the conditions of these experiments. It has its own importance, both as a proof of the reality of ESP and as proof that there are personality correlates of ESP success. It leaves, as the authors point out, many further questions to be answered. What are the personality constituents of being a "sheep" or a "goat"? What other personality factors are relevant to ESP success? What factors are relevant to success which are not personality factors in the experimental subject? Dr. Schmeidler has attempted to study these further questions although she has not obtained answers to any of them as definite as the answer to the "sheep-goat" problem.

The instrument for these further inquiries has been mainly the Rorschach test. Since the reliability of Rorschach classifications is not high, it is not possible that these should show high correlations with any other measurable characteristic. It is, therefore, not surprising that correlations of ESP scores with Rorschach characteristics are insufficiently high for the authors to claim much certainty for their indications. As indications they are, however, interesting. Well balanced subjects seemed to have higher ESP scores than the highly repressed, and the best ESP scores seemed to come from those subjects who were uncritically receptive of the Rorschach images. A study of ESP scores in patients suffering from cerebral concussion seemed to indicate that passive, unreasoning acceptance of impressions from the outer world was favorable to ESP ability.

The care with which conclusions are drawn and the clear indications as to where certainty would be unjustified are particular merits of this book. It is disappointing to find on p. 46 a reversion to Dr. Schmeidler's original calculation of the significance of the difference between the mean scores of sheep and goats as evidence of the reality of the difference in scoring level of these two categories. This calculation is certainly all that is required to demonstrate the force of the evidence from these experiments for the reality of ESP, but to show that the observed difference is due to the sheep-goat difference, it is necessary to employ some method of estimating significance which treats the individual subject and not the guess as the unit. A correlation (as calculated in the Rorschach part of this work) or a contingency table of subjects scoring above and below chance fulfils this condition of treating the individual subject as the unit. This

objection is a somewhat academic one when applied to this particular piece of work since there are so many subjects that the difference between sheep and goats would be certainly significant however it was calculated, and the fact that this method somewhat overestimates the significance is unimportant. But it remains a bad example for other workers. For example, on p. 55 an experiment by Bevan using this method is quoted without a query, although Bevan only had ten subjects in each of his groups and there is no ground for supposing that a test by a contingency table would show that his differences were significant and not due to the chance inclusion of one or more high scorers in his higher scoring groups.

There is some diversity of findings in those who have studied personality correlates of ESP success, and the student may wonder whether these are not sometimes due to differences in personality between different experimenters. The authors of this book have drawn attention to this possibility. They suggest indeed that the correct report may be: "With such-and-such type of experimenter, and with such-and-such procedure, such-and-such personality traits of the subject are positively related to high scores." This is, I think, a valuable and important suggestion which indicates large areas for future research directed towards making specific the unknown quantities indicated by the words "such-and-such."

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PARAPSYCHOLOGICAL ABSTRACTS

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[This section consists of abstracts of reports published in other journals and of unpublished reports filed at the Parapsychology Laboratory of Duke University. Readers may obtain unabridged copies (Thermo-Fax) of the unpublished reports by writing to the Journal of Parapsychology, College Station, Durham, N. C. The price is ten cents per page.]

MURPHY, G. Trends in the study of extrasensory perception. *Amer. Psychologist*, 1958, **13**, 69-76.

In reply to the growing interest among psychologists in parapsychology as a field of inquiry, Murphy has attempted to survey briefly the types of parapsychological studies in progress, the main areas of research findings, and the special problems encountered by workers in this field. Little experimentation is any longer being done to "prove ESP." Instead, contemporary parapsychological investigations are largely concerned with attempts at defining the working conditions under which specific psi phenomena operate. (Adequate experimental safeguards, the use of conservative standard statistics and proper handling of the data are accepted as a matter of course in all serious research today.) Notable among the paramenters shown to be related to scoring success are psychological conditions such as the motivation of the subject, his attitude toward the task, novelty vs. satiation, and the structure of the perceptual field. On the other hand, physical dimensions such as the size of stimulus or its distance from the subject appear to be of little or no relevance.

Murphy examines several positions taken by psychologists with respect to the ESP data, in particular: (1) the view that the amount of evidence needed for the ESP hypothesis is directly proportional to the amount of its antecedent improbability, and hence, a matter of weighing probabilities; (2) the argument (which Murphy says he fails to understand) that probability theory and the statistical structure based upon it are inadequate; and (3) the belief that ESP must fit into a larger conceptual scheme ("make sense") before it

can be incorporated into the body of science. On the basis of the empirical findings, Murphy maintains that there is no hypothesis today that can seriously compete with the ESP hypothesis (excepting fraud, of course), but he also feels that there is a great need for repeatable experiments and for a coherent theory. Underlying both of these is the need for obtaining a larger force of active investigators, "sensitive to the enormous challenge and resolute in the application of the best modern research methods."

GLOSSARY

A description of the basic experimental methods, of the findings, and of the statistical procedures for evaluating ESP and PK results may be found in *Parapsychology, Frontier Science of the Mind* by J. B. Rhine and J. G. Pratt (published by Charles C. Thomas, Springfield, Illinois, U.S.A., Blackwell Scientific Publications, Ltd., Oxford, England, and The Ryerson Press, Toronto, Canada).

AGENT: The "sender" in tests for telepathy, the person whose mental states are to be apprehended by the percipient. In GESP tests, the person who looks at the stimulus object.

BT (Basic Technique): The clairvoyance technique in which each card is laid aside by the experimenter as it is called by the subject. The check-up is made at the end of the run.

CALL: The ESP symbol selected by the subject in trying to identify a target.

CHANCE: The complex of undefined causal factors irrelevant to the purpose at hand.

Chance Expectation = Mean Chance Expectation: The most likely score if only chance variation is present.

Chance Average: Mean chance expectation expressed as an expected score, generally in terms of average per run.

CHI SQUARE: A sum of quantities each of which is a deviation squared divided by an expected value. Also a sum of the squares of CR's.

CLAIRVOYANCE: Extrasensory perception of objective events as distinguished from telepathic cognition of the mental activities of another person.

CR (Critical Ratio): A measure to determine whether or not the observed deviation is significantly greater than the expected random fluctuation about the average. The CR is obtained by dividing the observed deviation by the standard deviation. (The probability of a given CR may be obtained by consulting tables of the probability integral, such as Pearsons.)

CR_d (Critical Ratio of the Difference): The observed difference between the average scores of two samples of data divided by the standard deviation of the difference.

DEVIATION: The amount an observed number of hits or an average score varies from the mean chance expectation or chance average. A deviation may be total (for a series of runs) or average (per run).

DISPLACEMENT: ESP responses to targets other than those for which the calls were intended.

Backward Displacement: ESP responses to targets preceding the intended targets. Displacement to the targets one, two, three, etc. places preceding the intended target are designated as (—1), (—2), (—3), etc.

Forward Displacement: ESP responses to targets coming later than the intended targets. Displacement to the targets one, two, three, etc. places after the intended target are designated as (+1), (+2), (+3), etc.

DT (Down Through): The clairvoyance technique in which the cards are called down through the pack before any are removed or checked.

ESP (Extrasensory Perception): Awareness of or response to an external event or influence not apprehended by sensory means.

ESP CARDS: Cards, each bearing one of the following five symbols: star, circle, square, cross and waves (three parallel wavy lines).

ESP PACK: Twenty-five ESP cards.

Closed Pack: An ESP pack composed of five each of the five symbols.

Open Pack: An ESP pack made up of the ESP symbols selected in random order.

EXPECTATION: See *Chance.*

EXTRACHANCE: Not due to chance alone.

FREE MATERIAL: The stimulus objects of experiments in which an unlimited or unspecified range of stimulus objects is employed (as contrasted with methods such as card-calling in which the subject knows that the stimulus object is one of a known range).

GESP (General Extrasensory Perception): A technique designed to test the occurrence of extrasensory perception, permitting either telepathy or clairvoyance or both to operate.

MCE (Mean Chance Expectation): see *Chance.*

P (Probability): A mathematical estimate of the expected relative frequency of a given event if chance alone were operative.

PARAPSYCHOLOGY: A division of psychology dealing with behavioral or personal effects that are demonstrably nonphysical (that is, which do not fall within the scope of known physical principles).

PERCIPIENT = SUBJECT: The person who makes the calls in an ESP test.

PK (Psychokinesis): The direct influence exerted on a physical system by a subject without any known intermediate physical energy or instrumentation.

PLACEMENT TEST: A PK technique in which the aim of the subject is to try to influence falling objects to come to rest in a designated part of the throwing surface.

PRECOGNITION: Cognition of a future event which could not be known through rational inference.

PREFERENTIAL MATCHING: A method of scoring responses to free material. A judge ranks the stimulus objects (usually pictures in sets of four) with respect to their similarity to, or association with, each response; and/or he ranks the responses with respect to their similarity to, or association with, each stimulus object.

PSI: A general term to identify personal factors or processes which are nonphysical in nature. It approximates the popular use of the word "psychic" and the technical one, "parapsychical."

PSI-MISSING: Exercise of psi ability in a way that avoids the target the subject is attempting to hit.

PSI PHENOMENA: Occurrences which result from the operation of psi. They include the phenomena of both ESP (including precognition) and PK.

PSYCHICAL RESEARCH: Older term used for parapsychology.

QD (Quarter Distribution): The distribution of hits in the record page (or in a logical subdivision thereof, such as the set or the half-set) as found in the four equal quarters formed by dividing the selected unit horizontally and vertically.

RANDOM ORDER: An order of events which displays no trends or regularities that would allow any inference regarding one event from one or more of the others in the series.

RUN: A group of trials, usually the successive calling of a deck of 25 ESP cards or symbols. In PK tests, 24 single die throws regardless of the number of dice thrown at the same time.

SCORE: The number of hits made in any given unit of trials.
Total Score: Total of scores made in a given number of runs.
Average Score: Total score divided by number of runs.

SD (Standard Deviation): Usually the theoretical root mean square of the deviations. It is obtained from the formula $\sqrt{npq}$ in which n is the number of single trials, p the probability of success per trial, and q the probability of failure.

SERIES: Several runs or experimental sessions that are grouped in accordance with a stated principle.

SESSION: A unit of an ESP or PK experiment comprising all the trials of one test occasion.

SET: A subdivision of the record page serving as a scoring unit for a consecutive group of trials, usually for the same target.

SIGNIFICANCE: A numerical result is significant when it equals or surpasses some criterion of degree of chance improbability. The criterion commonly used in parapsychology today is a probability value of .01 or less, or a deviation in either direction such that the CR is 2.58 or greater.

SINGLES TEST: A PK technique in which the aim of the subject is to try to influence dice to fall with a specified face up.

SPONTANEOUS PSI EXPERIENCE: Natural, unplanned occurrence of an event or experience that seems to involve parapsychical ability.

STIMULUS OBJECT: The ESP card or drawing or other object, some identifying characteristic of which is to be apprehended by the percipient.

STM (Screened Touch Matching): An ESP card test in which the subject indicates in each trial (by pointing to one of five key positions) what he thinks the top card is in the inverted pack held by the experimenter behind a screen. The card is then laid opposite that position.

SUBJECT: The person who is experimented upon. In ESP tests, most commonly the percipient (though also the agent in GESP and telepathy). In PK tests, any individual whose task it is to influence the objects thrown.

TARGET: In ESP (including precognition) the objective or mental events the subject is attempting to respond to. In PK tests, the faces of the die which the subject attempts to bring up in the act of throwing. In placement tests, the designated part of the throwing surface.

Target Card: The card which the percipient is attempting to identify or otherwise indicate a knowledge of.

Target Pack: The pack of cards the order of which the subject is attempting to identify.

Target Face: The face on the die which the subject tries to turn up by PK.

TELEPATHY: Extrasensory perception of the mental activities of another person (as distinguished from clairvoyant cognition of objective events).

TRIAL: In ESP tests, a single attempt to identify a stimulus object. In PK tests, a single throw of the dice or other objects thrown.

HERE AND THERE IN THE LITERATURE

"The *truth* is all I seek: and I think there is a very important truth to be educed from the further investigation of this subject [which today would be called parapsychology] in its various relations—in short, a truth of paramount importance to all others; one which contains evidence of a fact, in which we are more deeply concerned than any other; and which, if well established, brings demonstration to confirm intuition and tradition. I am very well aware of all the difficulties in the way—difficulties internal and external; many inherent to the subject itself, but inseparable from it, and I am very far from supposing that my book is to settle the question, even with a single mind. All I hope or expect is, to show that the question is not disposed of yet, either by the rationalists or the physiologists: and that it is still an open one: and all I desire is, to arouse inquiry and curiosity; and that thus some mind, better qualified than mine to follow out the investigation, may be incited to undertake it."

Catherine Crowe, *The Night Side of Nature*
Third Edition 1854—p. 173
(First Edition 1846)